AAMI Loves DSV!

To the Editor:

Drs. Nelson and Van De Water’s perceptive synopsis of the Association for the Advancement of Medical Instrumentation (AAMI) 1981 meeting is appreciated. This appeared in *Chest* May, 1982 reporting the previous (1981) meeting.

They are correct in stressing the enormous importance of digital subtraction angiography. Indeed, it promises to revolutionize cardiovascular diagnosis . . . and indeed, many diagnostic services to patients. However, I do think it appropriate to point out that in the May, 1982 *Chest* review the authors were describing the May, 1981 meeting. We do depend considerably on submitted papers. Program planning in 1980 for 1981 did underappreciate digital subtraction angiography. It did not reflect “decreasing involvement of physicians.” The reverse is true. There has been increasing physician participation. We like that.

An additional note of some relevance is the AAMI survey of several hundred of the world’s leading surgeons. They were asked to list the five leading instrumentation breakthroughs of the 20th century and the same for the decade of the 70s. The results were published in the July-August, 1981 *Medical Instrumentation*. Computerized axial tomography was a runaway diagnostic instrumentation leader. The vast importance of the simplicity of venous contrast injection with clear arterial mapping was underappreciated.

The survey was, however, another manifestation of increasing physician participation in AAMI. So come aboard, Drs. Nelson and Van De Water. You are the type of constructive critics that augment AAMI’s good purpose.

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To the Editor:

I regret Dr. Harken was dismayed at our words “decreasing involvement of physicians.” Making that statement, I was referring to the following factors:

1. Actual participation at the 1981 AAMI meeting. I saw a great number of younger physicians and a multitude of engineering type people; however, with the exception of Drs. Rainer, Harken, and Dennis, I don’t recall seeing any of the older or more established physicians. Where were the professors and chiefs of departments?

2. I had the distinct impression that the majority of papers were presented by PhDs who in turn had done the majority of the work.

3. At the 1981 meeting, there was special emphasis on the biomedical technician. This, of course, is good and necessary, but I would like to see a demand from physicians for comparable special programs.

4. A general feeling that the average physician is beginning to accept the biomedical engineer or biomedical technician to such a degree that he is becoming totally dependent on him. Fifteen years ago when we started measuring pulmonary artery pressures and cardiac outputs on a routine basis, it was the physician who not only inserted the lines, but made all the other fluid and electrical connections including standardization of the preamplifiers.

It is extremely encouraging to me to hear from Dr. Harken. While the numbers of professors may be small, their quality, their dedication and their concern for AAMI and its goals is very large.

In the increasing pressure to become a superspecialist, I feel that we as physicians are abrogating our responsibility for the field of medicine as a whole and more importantly, are running the risk of giving up our role as educated leaders in our society.

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Possible Sites of Rupture at the Aorta
Ascendens and the Aortic Arch following Aortic Dissection

To the Editor:

Aortic dissection, a relatively common illness, is caused by the sudden development of a tear in the aortic intima, opening the way for a column of blood driven by the force of arterial pressure to enter the aortic wall, destroying the media and stripping the intima from the adventitia for variable distances along the length of the aorta. Finally, the dissecting column may rupture through the adventitia anywhere along the aorta.¹

Considering the possibility of a rupture through the adventitia along the ascending aorta and aortic arch, I would like to emphasize that such ruptures should appear more frequently at the inside than at the outside surface of the aortic curvature. The above hypothesis is based on the following:

To assess an equilibrium between transmural pressure and circumferential wall tension at any point on the outside of the aorta ascendens and the aortic arch where the surface is synclastic, the former should equal the latter times 1/R₂ + 1/R₁, where R₁ represents the radius of the aorta and R₂ the radius of the outer curvature of the arch. Instead, for the assessment of an equilibrium at any point on the inside of the aorta ascendens and the aortic arch where the surface is antilastic, transmural pressure should equal circumferential wall tension times 1/R₁ - 1/R₂, where R₁ represents the radius of the aorta and R₂ the radius of the inner curvature of the arch (Fig 1). Since transmural pressure is similar everywhere along the aorta, the circumferential tension required in the wall on the inside perimeter of the curvature to hold the aortic pressure in equilibrium is much greater than that required on the outside perimeter of the curvature. Not surprisingly, the wall at the inner perimeter of the curvature is thicker than at the outer perimeter of the curvature. It has been calculated that the ratio of thickness at the inner, to thickness at the outer perimeter is given by (n - 1) (n + 2)/(n + 1) (n - 2), where n is the ratio of the radius of the arch (to the axis of the aorta) to the radius of the aorta.²

In the case of circumferential aortic dissections along the ascending aorta and aortic arch, the ratio of thickness at the bottom to thickness at the top would approximately equal 1 (the thickness of the adventitia). This would mean multiple circumferential wall tension at the inside compared to the outside curvature of the aorta and a greater possibility of rupture at the inner than at the outer surface of this vessel.

Pathologically, it is not easy to demonstrate the external rupture when this has occurred into the superior mediastinum or pleural cavity, because the loose tissues outside the